

# NMDCAT

## FINAL SESSION PAPER-1

**Total MCOs: 200**

**Max. Marks: 200**

# BIOLOGY

- Q.1 The outermost boundary in most of the plant cells is:  
a. Cell membrane  
b. Plasma-lemma  
c. Cell wall  
d. Tonoplast
- Q.2 The nuclei of both plant and animal cells contain one or more dense bodies known as nucleoli. Which one of the following correctly describes the function of nucleoli?  
a. The formation of new DNA molecules  
b. The organization of the spindle during nuclear division  
c. The replication of mitochondria following nuclear division  
d. The formation of ribosomes
- Q.3 What is the function of the smooth endoplasmic reticulum in eukaryotic cells?  
a. Aerobic respiration  
b. Intercellular digestion  
c. Synthesis of steroids  
d. Synthesis and transport of proteins
- Q.4 Phagocytosis is the common character of:  
a. Bacterial cells  
b. Plant cells  
c. Animal cells  
d. Fungal cells
- Q.5 Identify the precise difference between mitochondria and chloroplast:  
a. ATP is synthesized only in mitochondria  
b. DNA is found only in chloroplasts  
c. Small 70S ribosomes are only found in chloroplasts  
d. NADP is found only in chloroplasts
- Q.6 A tadpole's tail is gradually broken down during metamorphosis into an adult frog. Which organelle increases in number in the cells of the tail at this time?  
a. Centriole  
b. Endoplasmic reticulum  
c. Golgi apparatus  
d. Lysosome
- Q.7 During the formation of one molecule of sucrose, a water molecule is released which takes its 'OH' group from:  
a. Maltose  
b. Galactose  
c. Fructose  
d. Glucose
- Q.8 Which bond is the potential source of chemical energy for cellular activities?  
a. C-N  
b. C-O  
c. C-H  
d. H-O
- Q.9 The number of peptide bonds formed and water molecules released during formation of 100 amino acids containing single chain protein will be:
- |    | No. of Peptide Bonds Formed | No. of Water Molecules Released |
|----|-----------------------------|---------------------------------|
| a. | 100                         | 100                             |
| b. | 99                          | 99                              |
| c. | 99                          | 100                             |
| d. | 100                         | 99                              |
- Q.10 The final structure of a single beta chain of haemoglobin is:  
a. Primary  
b. Tertiary  
c. Secondary  
d. Quaternary
- Q.11 Myosin tail is a \_\_\_\_\_ type of protein.  
a. Intermediate  
b. Simple  
c. Globular  
d. Fibrous
- Q.12 Which one of the following pyrimidine base is absent in DNA?  
a. Uracil  
b. Thymine  
c. Cytosine  
d. Adenine

	No. of Peptide Bonds Formed	No. of Water Molecules Released
a.	100	100
b.	99	99
c.	99	100
d.	100	99



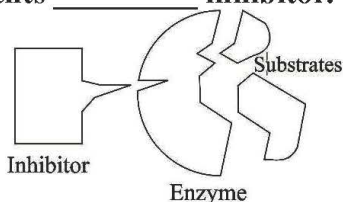
**Q.13** It is a unifying feature of all the co-factors used by various enzymes in the cell:

- a. Organic in nature
- b. Inorganic in nature
- c. Protein
- d. Non-protein

**Q.14** At freezing point, the enzymes of human body may be:

- a. Ionized
- b. Denatured
- c. Saturated
- d. Inactivated

**Q.15** The following figure represents \_\_\_\_\_ inhibitor.



- a. Non-competitive
- b. Competitive
- c. Irreversible
- d. Isosteric

**Q.16** The first step of non-cyclic photophosphorylation is:

- a. Electron Transport Chain
- b. Photolysis
- c. Photo-excitation of electrons
- d. NADPH formation

**Q.17** How many G3P molecules are recycled to produce three molecules of RuBP during Calvin cycle?

- a. 1
- b. 3
- c. 15
- d. 5

**Q.18** The end product of preparatory phase of glycolysis during cellular respiration in human cells will be:

- a. Lactic Acid
- b. Alcohol
- c. Pyruvate
- d. G3P

**Q.19** In respiratory chain,  $\text{FADH}_2$  causes reduction of:

- a. Coenzyme Q
- b. Cytochrome c
- c. Cytochrome a
- d. Cytochrome b

**Q.20** These compounds commonly found in both mitochondria and chloroplast:

- a. Rubisco
- b. Cytochromes
- c. Chlorophylls
- d.  $\text{NADP}^+$  reductase

**Q.21** Which of the following types of mammalian cell does not carry out oxidative phosphorylation?

- a. Erythrocytes
- b. Oxyntic cell
- c. Neuron
- d. Cardiac muscle cell

**Q.22** The shape of HIV capsid is:

- a. Spherical
- b. Conical
- c. Square
- d. Polyhedral

**Q.23** It is a common attribute of all viruses:

- a. Contains both DNA and RNA
- b. Have common mode of transmission
- c. Obligate intra-cellular parasites
- d. Equipped with lipoprotein envelope

**Q.24** All of these are ways of transmission of HIV except:

- a. Blood
- b. Placenta
- c. Breast feeding
- d. Saliva

**Q.25** Cocci are mostly:

- a. Atrichous
- b. Lophotrichous
- c. Monotrichous
- d. Peritrichous

**Q.26** It is not present in cytoplasmic matrix of bacteria?

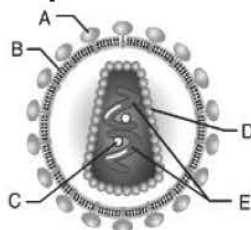
- a. Mesosomes
- b. Granules
- c. Ribosomes
- d. Microtubules

**Q.27** It is the most distinctive feature of the members belongs to kingdom fungi:

- a. Glycogen storage
- b. Conjugation
- c. Absence of centrioles
- d. Nuclear Mitosis



**Q.28** The diagram below shows an HIV particle:



\_\_\_\_\_ is made up of lipoproteins, while \_\_\_\_\_ is nucleic acid in nature, respectively.

- a. B, D
- c. A, B

- b. B, E
- d. D, E

**Q.29** \_\_\_\_\_ are a large group of parasitic protozoa.

- a. Amoebae
- c. Zooflagellates

- b. Apicomplexans
- d. Ciliates

**Q.30** The one which is non-vascular seedless plants is:

- a. Cooksonia
- c. Marchantia

- b. Lycopodium
- d. Adiantum

**Q.31** Pick odd one out regarding plants:

- a. Multicellular
- c. Photosynthetic

- b. Seedless or seed producing
- d. Unicellular sex organs

**Q.32** The phylum having largest biodiversity on earth is:

- a. Annelida
- c. Mollusca

- b. Chordata
- d. Arthropoda

**Q.33** If a plasmolyzed plant cell is placed in hypotonic solution it will:

- a. Turgid
- c. Shrink

- b. Burst
- d. Remain same

**Q.34** Which vein has oxygenated blood?

- a. Renal vein
- c. Pulmonary vein

- b. Subclavian vein
- d. Jugular vein

**Q.35** Right atrium is separated from right ventricle by:

- a. Tricuspid valve
- c. Semilunar valve

- b. Bicuspid valve
- d. Septum

**Q.36** In humans, the closed sac which surrounds the heart is:

- a. Endocardium
- c. Pericardium

- b. Myocardium
- d. Epicardium

**Q.37** Which of the following blood vessels contain semilunar valves?

- a. Arteries
- c. Arterioles

- b. Veins
- d. Capillaries

**Q.38** The lymphatic vessels of the body empty the lymph into blood stream at the:

- a. Abdominal vein
- c. Jugular vein

- b. Subclavian vein
- d. Bile duct

**Q.39** A person survived after Covid-19 may develop \_\_\_\_\_ immunity.

- a. Artificial Active
- c. Natural Active

- b. Artificial Passive
- d. Natural Passive

**Q.40** Antibodies are proteins and made up of how many polypeptide chains?

- a. One
- c. Three

- b. Two
- d. Four

**Q.41** What are three components of mechanism of homeostatic regulations?

- a. Receptors, control center and effectors
- c. CNS, PNS and diffused nervous system

- b. Sensory, motor and associative neurons
- d. Cerebrum, cerebellum and pons

**Q.42** Urination is controlled by sphincters present at junction of:

- a. Ureters and bladder
- c. Ureters and renal pelvis

- b. Urethra and bladder
- d. Collecting ducts and pelvis

**Q.43** All of the following are related to juxtamedullary nephrons except:

- a. Equipped with short loop of Henle
- c. Formation of concentration of urine

- b. Vasa Recta
- d. Presence of glomerulus in renal cortex





- Q.44** The site of the nephron which is specialized for maximum reabsorption of useful nutrients from the filtrate is:  
a. Descending limb  
c. Proximal convoluted tubule  
b. Collecting duct  
d. Ascending limb
- Q.45** Which of following is responsible for thermoregulation in humans?  
a. Hormone  
c. Skeletal muscle  
b. Skin  
d. All a, b, c
- Q.46** Most abundant type of muscles in human body are:  
a. Cardiac muscles  
c. Longitudinal smooth muscles  
b. Circular smooth muscles  
d. Skeletal muscles
- Q.47** Each dark band in skeletal muscles has lighter strip in its mid-section called:  
a. Z-line  
c. M-line  
b. H-zone  
d. I-band
- Q.48** Each muscle fiber is surrounded by a modified cell membrane called:  
a. Sarcolemma  
c. Myosin Filament  
b. Sarcomere  
d. Myofibrilament
- Q.49** Nociceptors are specialized for the detection of sense of:  
a. Deep pressure  
c. Pain  
b. Touch  
d. Vibration
- Q.50** Cell bodies of \_\_\_\_\_ neurons are always located inside the CNS.  
a. Sensory  
c. Associative  
b. Motor  
d. Afferent
- Q.51** How many  $\text{Na}^+$  are pumped out in response to two  $\text{K}^+$  transported into the nerve cell?  
a. 1  
c. 3  
b. 2  
d. 4
- Q.52** Find out the mismatched pair from the given options:  
a. Glucagon - Protein  
c. ADH - Amino acid derivative  
b. Oxytocin - Polypeptide  
d. Cortisone - Steroid
- Q.53** Which hormonal pair shares a common hypothalamic releasing factor?  
a. STH and LH  
c. FSH and STH  
b. ACTH and LH  
d. FSH and LH
- Q.54** The maximum thickness of uterus is attained during \_\_\_\_\_ phase.  
a. Menstrual  
c. Secretory  
b. Proliferative  
d. Menopause
- Q.55** Which of the following phases of ovarian and uterine cycle do not run in a parallel way?  
a. Follicular and Menstrual  
c. Luteal and Secretory  
b. Follicular and proliferative  
d. Follicular and Secretory
- Q.56** During menstrual cycle of 28 days, proliferative phase ends at:  
a. 13<sup>th</sup> day  
c. 27<sup>th</sup> day  
b. 15<sup>th</sup> day  
d. 21<sup>th</sup> day
- Q.57** How many phenotypes in *P. sativum* were studied by G. Mendel?  
a. 7  
c. 9  
b. 14  
d. 16
- Q.58** The combined probability of producing round and yellow seeds in dihybrid cross is:  
a. 3/16  
b. 9/16  
c. 1/16  
d. 1/4
- Q.59** If a hemophilic woman is married to a normal man, then they can have all except:  
a. Carrier daughter  
c. Hemophilic son  
b. Heterozygous daughter  
d. Normal son
- Q.60** How many round yellow seeds of  $F_2$  progeny were homozygous for both seed shape and color in dihybrid cross?  
a. 1/16  
c. 1/4  
b. 9/16  
d. 3/16
- Q.61** It is the mechanism that is responsible for the production of many different alleles of a gene:  
a. Gene linkage  
c. Gene mutation  
b. Gene duplication  
d. Gene splicing
- Q.62** The blood group alleles start their expression at:  
a. Time of birth  
c. Time of death  
b. Puberty  
d. Early embryonic life



- Q.63** In humans, the ABO blood group system is encoded by a single polymorphic gene which is located on:  
a. Autosome No. 4  
b. Autosome No. 7  
c. Autosome No. 9  
d. Autosome No. 19
- Q.64** The amount of DNA is fixed for a particular species as it depends upon:  
a. No of genes  
b. Amount of RNA  
c. No of chromosomes  
d. Size of cell
- Q.65** The DNA strand that is transcribed is called:  
a. Sense  
b. Coding  
c. Anti sense  
d. Complementary
- Q.66** All of the following are stop codons except:  
a. UAA  
b. UAG  
c. UGA  
d. AUG
- Q.67** Which of the following is constructed from 5' to 3'?  
a. Leading strand  
b. Lagging strand  
c. PCR products  
d. All a, b, c
- Q.68** Total number of nuclear codons that specifies amino acids are  
a. 45  
b. 170  
c. 61  
d. 64
- Q.69** Sickle cell Hb is the result of change in sequence of amino acids in:  
a. DNA  
b. One alpha chain  
c. One beta chain  
d. Both beta chains
- Q.70** S-type *Pneumococcus* are virulent due to presence of:  
a. Cell membrane  
b. Polysaccharide coat  
c. Cell wall  
d. All
- Q.71** In fishes the gill pouches develop into  
a. Gills  
b. Throat  
c. Eustachian tube  
d. Ear
- Q.72** Modern biological sciences suggest that \_\_\_\_\_ are the ancestors of all life.  
a. Protists  
b. Protozoans  
c. Prokaryotes  
d. Parazoans
- Q.73** Darwin's theory of evolution was mainly based on the evidences from:  
a. Geographical distribution and fossil record  
b. Fossil record and Embryology  
c. Geographical distribution and comparative anatomy  
d. Paleontology and Geology
- Q.74** \_\_\_\_\_ are used as important vectors in genetic engineering.  
a. Organoids  
b. Plasmids  
c. Nucleoids  
d. Mesosomes
- Q.75** Complementary DNA is produced by the action of \_\_\_\_\_ on RNA template.  
a. RNA polymerase  
b. Restriction endonuclease  
c. Reverse transcriptase  
d. DNA ligase
- Q.76** Which one of the following enzyme is temperature insensitive?  
a. DNA polymerase-I  
b. *Taq* polymerase  
c. DNA ligase  
d. RNA polymerase
- Q.77** It is an example of palindromic sequence:  
a. AGTC  
b. GGTA  
c. GCATGC  
d. AATTGC
- Q.78** During PCR, DNA strands are separated through:  
a. Helicase  
b. Primase  
c. Heat  
d. Chemically
- Q.79** Which one of the following is a correct sequence of PCR?  
a. Heating → Cooling → Add Primer → Copying of strand  
b. Heating → Add primer → Cooling → Copying of strand  
c. Add primer → Heating → Cooling → Copying of strand  
d. Cooling → Add primer → Heating → Copying of strand
- Q.80** The tiny and self-sealing holes in the protoplast can be generated through:  
a. Treatment by using chemicals  
b. Mechanical shaking  
c. Electric current  
d. Treatment with various enzymes



## CHEMISTRY

- Q.81** The limiting line of Balmer series lies in U.V region, while other lines fall in  
a. Visible region  
b. I.R region  
c. U.V region  
d. X-rays region
- Q.82** Which of the following is acidic buffer?  
a.  $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$   
b.  $\text{HCl} + \text{NaCl}$   
c.  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$   
d.  $\text{NH}_4\text{OH} + \text{HCl}$
- Q.83** Rate of zero order reaction \_\_\_\_\_  
a. Depends on concentration of one reactant  
b. Depends on concentration of two reactants  
c. Depends on concentration of three reactants  
d. Is independent of the initial concentration of reactants
- Q.84** A radioactive sample disintegrates 75% after 10 years. What will be the half-life of the sample?  
a. 5 Years  
b. 2 Years  
c. 3 Years  
d. 10 Years
- Q.85** The rate of reaction involving ions can be studied by  
a. Dilatometric method  
b. Electrical conductivity method  
c. Spectrometry method  
d. Differential method
- Q.86** When the change in concentration is  $6 \times 10^{-2} \text{ mol dm}^{-3}$  and time for that change is 100 seconds, the rate of reaction will be  
a.  $6 \times 10^{-3} \text{ mol dm}^{-3} \text{ sec}^{-1}$   
b.  $6 \times 10^{-2} \text{ mol dm}^{-3} \text{ sec}^{-1}$   
c.  $6 \times 10^{-4} \text{ mol dm}^{-3} \text{ sec}^{-1}$   
d.  $6 \times 10^{-5} \text{ mol dm}^{-3} \text{ sec}^{-1}$
- Q.87** Which of the following is correct about given reaction?  
 $\text{Mg (s)} + \frac{1}{2} \text{O}_2\text{(g)} \rightarrow \text{MgO (s)}$   $\Delta H = -692 \text{ kJ mol}^{-1}$   
a. Enthalpy of formation  
b. Enthalpy of lattice energy  
c. Enthalpy of atomization  
d. Enthalpy of ionization energy
- Q.88** Which of the following is endothermic?  
a. Dissolution of  $\text{NH}_4\text{Cl}$  in water  
b. Neutralization  
c. Evaporation  
d. Both a and c
- Q.89** Combustion of graphite to form  $\text{CO}_2$ , can be done by two ways. Reactions are given as follow  
 $\text{C} + \text{O}_2 \longrightarrow \text{CO}_2$   $\Delta H = -393.7 \text{ kJ mol}^{-1}$   
 $\text{C} + \frac{1}{2} \text{O}_2 \longrightarrow \text{CO}$   $\Delta H_1 = ?$   
 $\text{CO} + \frac{1}{2} \text{O}_2 \longrightarrow \text{CO}_2$   $\Delta H_2 = -283 \text{ kJ mol}^{-1}$   
a.  $-676 \text{ kJ mol}^{-1}$   
b.  $+110 \text{ kJ mol}^{-1}$   
c.  $-110 \text{ kJ mol}^{-1}$   
d.  $676 \text{ kJ mol}^{-1}$
- Q.90** Study the following reaction:  
 $8\text{H}^+ + \text{MnO}_4^- \rightarrow \text{Mn}^{+2} + 4\text{H}_2\text{O}$   
Which statement is true about this reaction?  
a. 5  $\text{e}^-$  are added in R.H.S  
b. 3  $\text{e}^-$  are added in L.H.S  
c. 3  $\text{e}^-$  are added in R.H.S  
d. 5  $\text{e}^-$  are added in L.H.S
- Q.91** The  $E^\circ$  value of standard silver half-cell is 0.80V, measured when it is connected with SHE i.e. Standard hydrogen electrode. In this case the half reaction taking place at SHE is  
a.  $2\text{H}^+_{(\text{aq})} + 2\text{e}^- \longrightarrow \text{H}_{2(\text{g})}$   
b.  $\text{H}_{2(\text{g})} \longrightarrow 2\text{H}^+_{(\text{aq})} + 2\text{e}^-$   
c.  $2\text{H}^+_{(\text{aq})} + 2\text{e}^- \longrightarrow 2\text{H}_{(\text{g})}$   
d.  $\text{H}_{2(\text{g})} \longrightarrow 2\text{H}_{(\text{g})} + 2\text{e}^-$
- Q.92** Oxidation number of carbon in ethanol and glucose respectively is  
a. +4, +4  
b. -2, 0  
c. 0, -2  
d. -2, +4
- Q.93** Which of the following is correct order of electron affinity  
a.  $\text{F} > \text{Cl} > \text{I}$   
b.  $\text{Cl} > \text{I} > \text{F}$   
c.  $\text{I} > \text{Cl} > \text{F}$   
d.  $\text{Cl} > \text{F} > \text{I}$





- Q.94** Which of following is iso-structural pair  
a.  $\text{BF}_3$ ,  $\text{NH}_3$   
b.  $\text{NH}_3$ ,  $\text{H}_3\text{O}^+$   
c.  $\text{SO}_2$ ,  $\text{CO}_2$   
d. All of these
- Q.95** Which of the following is more reactive metal?  
a. Mg  
b. Be  
c. Li  
d. Na
- Q.96** Which of the following elements has highest melting point?  
a. Al  
b. S  
c. Si  
d. P
- Q.97** Which of the following is the least reactive alkali metal?  
a. Rubidium  
b. Potassium  
c. Sodium  
d. Cesium
- Q.98** The outer electronic configuration of an atom is  $18[\text{Ar}] 3d^8, 4s^2$ , the atom is  
a. Manganese  
b. Chromium  
c. Iron  
d. Nickel
- Q.99** Which of the following transition metals ion does not show paramagnetic character?  
a.  $\text{Mn}^{2+}$   
b.  $\text{Fe}^{3+}$   
c.  $\text{Zn}^{2+}$   
d.  $\text{Cr}^{3+}$
- Q.100** In the first transition series the general increase in binding energy ends at \_\_\_\_\_  
a. Copper  
b. Zinc  
c. Scandium  
d. Vanadium
- Q.101** Ethyl ethanoate is functional group isomer of  
a. Butyric acid  
b. Butanone  
c. 2-Hydroxy propanoic acid  
d. Methyl propanoate
- Q.102** The anthracene is an organic compound which is categorized under  
a. Alicyclic hydrocarbons  
b. Acyclic Hydrocarbons  
c. Polycyclic hydrocarbons  
d. Heterocyclic hydrocarbons
- Q.103** The type of structural isomerism which arises due to the unequal distribution of carbon atoms on either side of the functional group is  
a. Chain isomerism  
b. Cis-Trans isomerism  
c. Position isomerism  
d. Metamerism
- Q.104** When propene is treated with water in the presence of conc.  $\text{H}_2\text{SO}_4$  the final product will be  
a. 1-Propanol  
b. Ethyl hydrogen sulphate  
c. 2-Propanol  
d. 2-Hydroxy propanoic acid
- Q.105**  $\text{CH}_3\text{COOH} \longrightarrow \text{CH}_3\text{CH}_3 + 2\text{H}_2\text{O}$  which of following reagent is used for given conversion  
a.  $\text{NaBH}_4$  / Ether  
b.  $\text{H}_2$  / Ni  
c.  $\text{LiAlH}_4$  / Ether  
d. HI / P
- Q.106** The secondary structure of protein is a regular coiling or zigzagging of polypeptide chains caused by hydrogen bonding between  
a. NH and  $\text{CH}_2$   
b.  $\text{CH}_2$  and  $\text{CO}_2$   
c. NH and  $\text{C=O}$   
d. NH and OH
- Q.107** Many enzymes contain a protein part and non-protein part. The protein part is known as  
a. Co-enzyme  
b. Co-factor  
c. Apo-enzyme  
d. Both a and b
- Q.108** The enzymatic reaction occurs best at or around \_\_\_\_\_  
a. 0 Kelvin  
b. 37 Kelvin  
c. 298 Kelvin  
d. 310 Kelvin
- Q.109** The  $e/m$  value of positive rays is minimum for  
a. Helium  
b. Nitrogen  
c. Oxygen  
d. Hydrogen
- Q.110** When 50 g lime stone ( $\text{CaCO}_3$ ) is heated then 21 g CaO is formed. What is %age yield of given reaction  $\text{CaCO}_3 \longrightarrow \text{CaO} + \text{CO}_2$   
a. 42 %  
b. 70 %  
c. 75 %  
d. 99 %



- Q.111** With decrease in the value of principal quantum number 'n' the shape of the s – orbitals remain same although their sizes
- Decrease
  - Remain the same
  - Increase
  - May or may not remain the same
- Q.112** Total number of carbon atoms present in 11g carbon dioxide (C=12, O = 16)
- $6.02 \times 10^{22}$
  - $6.02 \times 10^{23}$
  - $3.1 \times 10^{23}$
  - $1.5 \times 10^{23}$
- Q.113** The weight of a single molecule of oxygen gas is
- $5.32 \times 10^{-23}$ g
  - $5.32 \times 10^{23}$  g
  - $2.656 \times 10^{-23}$  g
  - 32 g
- Q.114** The formula used to find out the number of electrons in a shell is
- $n^2$
  - $2(2l + 1)$
  - $2 n^2$
  - $2l + 1$
- Q.115** Mathematically, Charle's law can be represented as
- $V \propto T$
  - $V_1/T_1 = V_2/T_2$
  - $V/T = K$
  - All of these
- Q.116** Which of the following gases has maximum root mean square velocity?
- CO<sub>2</sub>
  - O<sub>2</sub>
  - H<sub>2</sub>
  - N<sub>2</sub>
- Q.117** The chloroform (CHCl<sub>3</sub>) is miscible with acetone (CH<sub>3</sub>COCH<sub>3</sub>) due to
- Dipole-dipole forces
  - London dispersion forces
  - H-Bonding
  - Debye forces
- Q.118** Which of the following compounds has highest boiling point?
- Ammonia
  - Water
  - Hydrogen fluoride
  - Ethanol
- Q.119** Which one of the following is an example of non-polar molecular solid?
- Sodium chloride
  - Diamond
  - Dry ice
  - Sucrose
- Q.120** Sodium chloride in aqueous solution is conductor of electricity due to
- Free electrons
  - Free ions
  - Ionic bond
  - Free protons
- Q.121** The relationship between K<sub>p</sub> and K<sub>c</sub> for the following reaction is
- $$2\text{SO}_{2(g)} + \text{O}_{2(g)} \rightleftharpoons 2\text{SO}_{3(g)}$$
- $K_p = K_c (RT)^{1/2}$
  - $K_c = K_p (RT)^{1/2}$
  - $K_c = K_p (RT)$
  - $K_p = K_c (RT)$
- Q.122** Maximum yield of ammonia can be obtained during Haber's process by
- Continuous withdrawal of ammonia
  - Decreasing temperature
  - Increasing pressure
  - All of above
- Q.123** During the manufacture of SO<sub>3</sub>, Sulphur dioxide is oxidized to Sulphur trioxide. This reaction is given as
- $$2\text{SO}_{2(g)} + \text{O}_{2(g)} \rightleftharpoons 2\text{SO}_{3(g)} \quad \Delta H = -ve$$
- According to Le Chatelier's Principle
- Reaction must not be temperature dependent
  - Reaction must be carried out at room temperature
  - Reaction must be carried out at low temperature
  - Reaction must be carried out at high temperature
- Q.124** Which one is correct order about 1<sup>st</sup> ionization energy
- P > S > Cl
  - Cl > P > S
  - S > Cl > P
  - Cl > S > F
- Q.125** Vicinal dihalide on treating with a strong base eliminates two molecules of hydrogen halides from two adjacent carbons to give an
- Alkane
  - Alkyne
  - Alkene
  - Arene





- Q.126** Ethanal is prepared by the hydration of ethyne through the formation of  
 a. Ethanol  
 c. Propen-2-ol  
 b. Propen-1-ol  
 d. Vinyl alcohol
- Q.127** Chlorination of benzene in the presence of  $\text{FeCl}_3$  gives the product  
 a. Chlorobenzene  
 c. Methylbenzene  
 b. 1,2,3,4,5,6-Hexachloro cyclohexane  
 d. Chloro cyclohexane
- Q.128** Among the following, the compound that can be most readily sulphonated is  
 a. Chlorobenzene  
 c. Nitrobenzene  
 b. Benzene  
 d. Toluene
- Q.129** Which of the following alkyne does not show acidic character?  
 a. 2-Butyne  
 c. 1-Butyne  
 b. Ethyne  
 d. Propyne
- Q.130** Iso-propyl chloride has following carbon attached to chloro group  
 a. Tertiary  
 c. Quaternary  
 b. Secondary  
 d. Primary
- Q.131** 2-Chloro-2-methyl propane undergoes reaction by  
 a.  $\text{S}_{\text{N}}1$  or  $\text{S}_{\text{N}}2$  mechanism  
 c.  $\text{S}_{\text{N}}1$  mechanism only  
 b. Neither  $\text{S}_{\text{N}}1$  nor  $\text{S}_{\text{N}}2$  mechanism  
 d.  $\text{S}_{\text{N}}2$  mechanism only
- Q.132** Consider the reaction given below:  

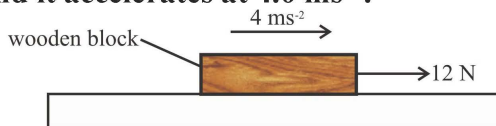
$$(\text{CH}_3)_3\text{C}-\text{Br} \xrightarrow[\text{alcohol}]{\text{KOH}} (\text{CH}_3)_2\text{C}=\text{CH}_2 + \text{HBr}$$
  
 Mechanism followed by the reaction is:  
 a.  $\text{E}2$   
 c.  $\text{E}1$   
 b.  $\text{S}_{\text{N}}1$   
 d.  $\text{S}_{\text{N}}2$
- Q.133** The order of reactivity of alcohols when O-H bond breaks  
 a. Primary > secondary > tertiary  
 c. Tertiary > Primary > secondary  
 b. Secondary > tertiary > primary  
 d. Tertiary > secondary > primary
- Q.134** Picric acid is another name of  
 a. 2,4,6-Tribromophenol  
 c. 2,4-Dinitrophenol  
 b. 2,4,6-Trinitrotoluene  
 d. 2,4,6-Trinitrophenol
- Q.135** The reaction of ethanol with sodium metal is an example of \_\_\_\_\_ reaction  
 a. Nucleophilic substitution  
 c. Electrophilic substitution  
 b. Elimination  
 d. Electrophilic addition
- Q.136** Which of the following carbonyl compounds give positive iodoform test?  
 a. Propanal  
 c. 3-Pentanone  
 b. Propanone  
 d. Methanal
- Q.137** Reaction of aldehyde and ketone with ammonia derivatives is example of \_\_\_\_\_ reaction  
 a. Nucleophilic addition  
 c. Addition-elimination  
 b. Nucleophilic substitution  
 d. Aldol condensation
- Q.138** Sodium borohydride reduces \_\_\_\_\_ to secondary alcohol  
 a. Butene  
 c. Butanal  
 b. Butyric acid  
 d. Butanone
- Q.139** Oxidation of alkenes gives carboxylic acid in presence of \_\_\_\_\_  
 a. Hot acidified  $\text{KMnO}_4$  solution  
 c.  $\text{LiAlH}_4$  solution  
 b. Cold acidified  $\text{KMnO}_4$  solution  
 d.  $\text{NaBH}_4$  solution
- Q.140**  $\text{CH}_3\text{COOH} + \text{PCl}_5 \longrightarrow ?$  the final product (s) formed  
 a.  $\text{CH}_3\text{COCl} + \text{POCl}_3$   
 c.  $\text{CH}_3\text{COCl} + \text{H}_2 + \text{HCl}$   
 b.  $\text{CH}_3\text{COCl} + \text{POCl}_3 + \text{HCl}$   
 d.  $\text{CH}_3\text{COCl} + \text{H}_2\text{O} + \text{POCl}_3$

## PHYSICS

- Q.141** A bullet of mass 50 g is fired horizontally from a building 45 m high. It reaches ground after  
 a. 1s  
 c. 3s  
 b. 5s  
 d. 4s
- Q.142** When a meteorite enters the earth atmosphere, it catches fire. Where does its momentum go?  
 a. Its momentum destroyed  
 c. Changed into light  
 b. Changed into heat  
 d. Transferred to air molecules

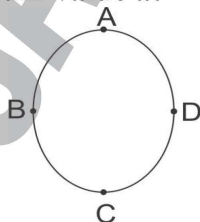


- Q.143** A wooden block of mass 0.60 kg is on a rough horizontal surface. A force of 12 N is applied to the block and it accelerates at  $4.0 \text{ ms}^{-2}$ .



What is the magnitude of the frictional force acting on the block?

- a. 2.4 N  
b. 9.6 N  
c. 14 N  
d. 16 N
- Q.144** A particle moves along the x axis from  $x_i$  to  $x_f$ , which of the following values of the initial and final coordinates, which results in the displacement with the largest magnitude?
- a.  $x_i = 4\text{m}, x_f = -2\text{m}$   
b.  $x_i = -4\text{m}, x_f = 4\text{m}$   
c.  $x_i = 4\text{m}, x_f = 6\text{m}$   
d.  $x_i = -4\text{m}, x_f = -8\text{m}$
- Q.145** Slope of work time graph is equal to
- a. Force  
b. Power  
c. Velocity  
d. Energy
- Q.146** K.E of an object of 2kg having velocity  $(\cos\alpha + \sin\alpha) \text{ ms}^{-1}$  will be
- a. 2J  
b.  $(2\cos\alpha)\text{J}$   
c. 1J  
d.  $(2\sin\alpha)\text{J}$
- Q.147** Find the work required to lift a mass of 5 tones to a height of 30m. If this is done in 2 minutes, what power is being used?
- a. 12262 W  
b. 14000 W  
c. 11000 W  
d. 15000 W
- Q.148** A machine needed 1000 J of energy to raise a 10 Kg block at a distance of 6 m, what is machine efficiency
- a. 39 %  
b. 59%  
c. 49 %  
d. 100%
- Q.149** At what point or points in this vertical loop of string attached with a stone, revolves in a circle. Tension in a string has maximum value at



- a. Point A  
b. Point B  
c. Point C  
d. Point D
- Q.150** A toy car moves around a circle of radius 0.3m at 2 revolution per second its angular speed is
- a.  $\pi \text{ rad/s}$   
b.  $2\pi \text{ rad/s}$   
c.  $4\pi \text{ rad/s}$   
d.  $8\pi \text{ rad/s}$
- Q.151** A particle is acted upon by a force of constant magnitude which is always perpendicular to the velocity of particle the motion of the particle takes place in a horizontal plane. It follows
- a. Linear momentum is constant  
b. It moves in a circular path  
c. Velocity is constant  
d. Particle move in straight line
- Q.152** In case of planets the necessary acceleration is provided by
- a. Gravitational force  
b. coulomb force  
c. frictional force  
d. centripetal force
- Q.153** When a wave goes from one medium to another medium, which one of the following characteristics of the wave remains constant
- a. Velocity  
b. Wavelength  
c. Frequency  
d. Phase
- Q.154** There is no net transfer of energy by particle of medium in
- a. Longitudinal wave  
b. Transverse wave  
c. Progressive wave  
d. Stationary wave





- Q.155** Product angular frequency and time period for an oscillator is  
 a. 1  
 c. 6  
 b. 3  
 d. Infinite
- Q.156** A wave generator produces 500 pulses in 10s. Find the frequency of pulse it produces  
 a. 50 pules  $s^{-1}$   
 c. 20 pules  $s^{-1}$   
 b. 40 pules  $s^{-1}$   
 d. 30 pules  $s^{-1}$
- Q.157** The thermodynamics process during which the volume of the system remains constant is called  
 a. Isothermal process  
 c. Adiabatic process  
 b. Isochoric process  
 d. Isobaric process
- Q.158** If amount of heat given to a system be 35J and then amount of work done by the system be +15J, then change in the internal energy of the system is:  
 a. -50J  
 c. -20J  
 b. +20J  
 d. 50J
- Q.159** If the time constant CR is small the capacitor will be charged or discharged  
 a. Slowly  
 c. Will not charge  
 b. Rapidly  
 d. Uniformly
- Q.160** A charge Q is divided into two parts q and Q-q and separated by a distance R. The force of repulsion between them will be maximum when:  
 a.  $q = \frac{Q}{4}$   
 c.  $q = Q$   
 b.  $q = \frac{Q}{2}$   
 d.  $q = \frac{Q}{3}$
- Q.161** A 5  $\mu F$  capacitor has a potential difference across its plates is 200 volts. The charge on the capacitor is  
 a.  $2.5 \times 10^{-8} C$   
 c.  $10^3 C$   
 b.  $10^{-3} C$   
 d.  $4 \times 10^3 C$
- Q.162** The energy stored per unit volume in an electric field of strength E volt/meter in a medium of dielectric constant K (in Joule/metre<sup>3</sup>) is:  
 a.  $\frac{1}{2} \epsilon_0 E^2$   
 c.  $\frac{1}{2} \cdot \frac{\epsilon_0 E^2}{K}$   
 b.  $\frac{1}{2} K \epsilon_0 E^2$   
 d.  $\frac{1}{2} K^2 \epsilon_0^2 E$
- Q.163** When a current of 1A flows for 5 sec through the lamp. How much charge flows through the lamp  
 a. 10C  
 c. 1C  
 b. 5C  
 d. Insufficient data
- Q.164** Three lamps of 100 W each are operated for 2 hours daily. Then energy consumed in one month will be  
 a. 1 kWh  
 c. 6 kWh  
 b. 18 kWh  
 d. 24 kWh
- Q.165** Circuit which gives continuously varying potential is called  
 a. Complex network  
 c. Potential divider  
 b. Wheat stone bridge  
 d. All of above
- Q.166** The power of two electric bulbs are 100 W and 200 W. Which are connected to the power supply of 220 V separately. The ratio of resistance of their filament will be  
 a. 1:2  
 c. 1:3  
 b. 2:1  
 d. 4:3
- Q.167** An electron is moving northward in a magnetic field directed vertically downward. The electron will be deflected.  
 a. Eastward  
 c. Vertically upward  
 b. Westward  
 d. Remain undeflected
- Q.168** An electron enters a region where the electric field E is perpendicular to the magnetic field B. It will suffer no deflection if  
 a.  $E = Bev$   
 c.  $E = Bv$   
 b.  $B = eE/v$   
 d.  $E = Bev/2$



- Q.169 Eddy current is produced when**  
 a. A metal is kept in changing magnetic field  
 b. A metal is kept in steady magnetic field  
 c. A circular coil is placed in a steady magnetic field  
 d. A current is passed through a circular coil
- Q.170 In electromagnetic induction, the induced e.m.f. in a coil is independent of**  
 a. Resistance of the circuit  
 b. Time  
 c. Change in the flux  
 d. None
- Q.171 The north pole of a magnet is brought near a metallic ring. The direction of the induced current in the ring will be**  
 a. Clockwise  
 b. Anticlockwise  
 c. Towards north  
 d. Towards south
- Q.172 A coil having an area  $2\text{m}^2$  is placed in a magnetic field which changes from  $1\text{Wb/m}^2$  to  $4\text{Wb/m}^2$  in a interval of 2 second. The e.m.f. induced in the coil will be**  
 a. 3 V  
 b. 1.5V  
 c. 2 V  
 d. 4V
- Q.173 The method by which only one half of A.C cycle is converted into direct current is called**  
 a. Half wave amplification  
 b. Full wave rectification  
 c. Half wave rectification  
 d. Full wave amplification
- Q.174 In full wave rectification, the output D.C. voltage across the load is obtained for**  
 a. The positive half cycle of input A.C.  
 b. The complete cycle of input A.C.  
 c. The negative half cycle of input A.C.  
 d. All of the above
- Q.175 The kinetic energy of electron and proton is  $10^{-32}\text{J}$ . Then the relation between their de-Broglie wavelengths is**  
 a.  $\lambda_p = \lambda_e$   
 b.  $\lambda_p > \lambda_e$   
 c.  $\lambda_p < \lambda_e$   
 d.  $\lambda_p = 2\lambda_e$
- Q.176 The velocity of a particle of mass m of de-Broglie wavelength  $\lambda$  is \_\_\_\_\_**  
 a.  $\frac{2h}{m\lambda}$   
 b.  $\frac{m\lambda c^2}{h}$   
 c.  $2m\lambda c^2$   
 d.  $h/m\lambda$
- Q.177 The no of spectral lines in Balmer series**  
 a. 2  
 b. 5  
 c. 3  
 d. Infinite
- Q.178  $^{90}_{38}\text{Sr}$  decays to  $^{90}_{39}\text{Y}$  by**  
 a. Emission of  $\alpha$ -particles  
 b. Emission of  $\beta$ -particles  
 c. Emission of  $1\alpha$  and  $2\beta$  particles  
 d. Absorption of electrons
- Q.179 The radioactivity of a certain radioactive element drops to  $1/64$  of its initial value in 30 seconds. Its half-life is**  
 a. 4 seconds  
 b. 3 seconds  
 c. 5 seconds  
 d. 2 seconds
- Q.180 Gamma radiation are emitted due to**  
 a. De-excitation of atom  
 b. De-excitation of nucleus  
 c. Excitation of atom  
 d. Excitation of nucleus

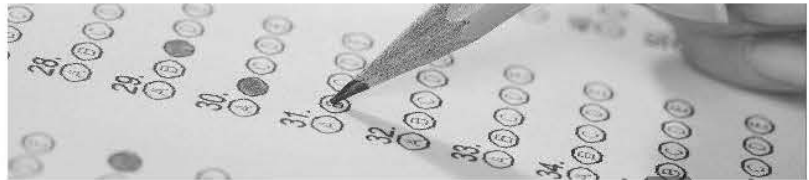
## ENGLISH

### Directions:

In the following sentences, some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected.

- Q.181** Many instructors are of the opinion that athletics provides good recreation to everyone.  
 a. b. c. d.
- Q.182** Improving democracy is about enhance the opportunities for people to make their own decisions.  
 a. b. c. d.
- Q.183** If your friendship be genuine, based on loyalty and mutual affection, there is little which can destroy it.  
 a. b. c. d.





**Q.184** He hesitated to accept the post as he did not think the salary would be enough for the man with a family of ten.

a. b. c. d.

**Q.185** It is indeed commendable that the apex court has deemed it necessary to remind the government of its duties in promoting education and investing it.

a. b. c. d.

**Q.186 Who is creating this mess? Choose the correct Passive.**

- a. Who has created this mess?
- b. By whom has this mess been created?
- c. By whom this mess is being created?
- d. By whom is this mess being created?

**Q.187 The teacher said, "Be quiet, boys." Choose the correct indirect.**

- a. The teacher said that the boys should be quiet.
- b. The teacher called the boys and ordered them to the quiet.
- c. The teacher urged the boys to be quiet.
- d. The teacher commanded the boys that they be quiet.

**Directions:**

In each question in the following, four alternative sentences are given. Choose the CORRECT one and fill the circle corresponding to that letter in the answer sheet.

**Q.188**

- a. When consciousness returned this bewildered victim inquired, "Why sir, this cruel usage?"
- b. When consciousness returned, this bewildered victim inquired: "Why, sir, this cruel usage?"
- c. When consciousness returned, this bewildered victim inquired, "Why sir this cruel usage?"
- d. When consciousness returned this bewildered victim inquired: "Why, sir this cruel usage?"

**Q.189**

- a. No sooner did he collide with the glass window than it shattered and produced countless facets of light.
- b. No sooner did he collide with the glass window, it shattered and produced countless facets of light.
- c. No sooner did he collide with the glass window when it shattered and produced countless facets of light.
- d. No sooner he collided with the glass window than it shattered and produced countless facets of light.

**Q.190**

- a. Despite being tried his best to persuade people to give up smoking, he could not attain success.
- b. Despite of his best trying to persuade people to give up smoking, he could not attain success.
- c. Despite trying his best to persuade people to give up smoking, he could not attain success.
- d. In spite of being tried his best to persuade people to give up smoking, he could not attain success.

**Q.191 The same person who never had made a single mistake began straying from one Surah to another. The underlines clause is a/ an \_\_\_\_\_.**

- a. Noun clause
- b. Adjective clause
- c. Pronoun clause
- d. Adverb clause

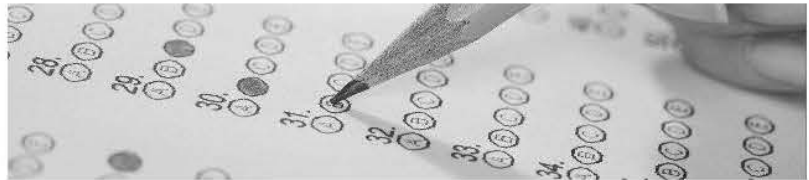
**Q.192 The owner of the shop, wearing a long robe and a silk turban, greeted him warmly. The underlines phrase is a/ an \_\_\_\_\_.**

- a. Participial phrase
- b. Gerund phrase
- c. Verb Phrase
- d. Adverb Phrase

**Q.193 I didn't see the film, nor did I have time to read the book. Identify the type of sentence.**

- a. Simple
- b. Compound
- c. Complex
- d. Compound Complex

**Q.194 Well, who would have thought it? Identify the Part of Speech of the underlined word.**



- a. Adverb
- c. Interjection**

- b. Adjective
- d. Modifier

**Directions:**

Choose the right option to complete the following sentences.

**Q.195** We finished the report but forgot to turn it \_\_\_\_\_.

- a. Out
- b. Away
- c. In**
- d. On

**Q.196** For businessmen, the question is all about \_\_\_\_\_ the benefits before entering into new deals.

- a. Weighing up**
- b. Swarming up
- c. Sagging off
- d. Speckling with

**Q.197** What is the **Synonym** of “BRISKLY”?

- a. Readily**
- b. Rarely
- c. Brutally
- d. Senuously

**Q.198** What is the **Synonym** of “MOUNTING”?

- a. Contracting
- b. Clambering**
- c. Descending
- d. Crumbling

**Q.199** What is the **Antonym** of “BASHFUL”?

- a. Brash**
- b. Dash
- c. Trash
- d. Dank

**Q.200** What is the **antonym** of “SPECKLED WITH”?

- a. Commonplace
- b. Spick and Span**
- c. Dappled
- d. Flawless